

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

REC'D 01 MAY 2006

WIPO

PCT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference		<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. PCT/EP2004/014777		International filing date ( <i>day/month/year</i> ) 23.12.2004	Priority date ( <i>day/month/year</i> ) 28.01.2004
International Patent Classification (IPC) or national classification and IPC INV. C08J9/16 C08J9/28			
Applicant UNILEVER PLC et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 8 sheets, as follows:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the report</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>			
Date of submission of the demand  11.10.2005		Date of completion of this report  28.04.2006	
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer  Meier, S Telephone No. +49 89 2399-8312	



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/014777

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on

- the international application in the language in which it was filed
- a translation of the international application into , which is the language of a translation furnished for the purposes of:
  - international search (under Rules 12.3(a) and 23.1(b))
  - publication of the international application (under Rule 12.4(a))
  - international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

3-8, 10-38	as originally filed
1, 2, 9	received on 14.10.2005 with letter of 13.10.2005

**Claims, Numbers**

3(part), 4-21	received on 14.10.2005 with letter of 13.10.2005
1, 2, 3(part)	filed with telefax on 29.03.2006

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/014777

---

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

---

1. Statement

Novelty (N)	Yes:	Claims	10-19
	No:	Claims	1-9,20,21
Inventive step (IS)	Yes:	Claims	-
	No:	Claims	1-21
Industrial applicability (IA)	Yes:	Claims	1-21
	No:	Claims	-

2. Citations and explanations (Rule 70.7):

**see separate sheet**

---

**Box No. VIII Certain observations on the international application**

---

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/EP2004/014777

Reference is made to the following documents:

- D1: WO 03/091321 A (THE UNIVERSITY OF LIVERPOOL; COOPER, ANDREW, IAN; ZHANG, HAIFEI)
- D2: WO 99/00187 A (BIOPORE CORPORATION)
- D3: H. ZHANG, A. I. COOPER: "Synthesis of Monodisperse Emulsion-Templated Polymer Beads by Oil-in-Water-in-Oil (O/W/O) Sedimentation Polymerization" CHEM. MATER., vol. 14, 2002, pages 4017-4020, XP002327996
- D4: US-A-5 723 508 (HEALY ET AL)
- D5: WO 2004/011537 A (UNILEVER N.V; UNILEVER PLC; HINDUSTAN LEVER LIMITED; COOPER, ANDREW, I)
- D6: WO 2005/014704 A (THE UNIVERSITY OF LIVERPOOL; COOPER, ANDREW; BUTLER, RACHEL)

**Re Item VIII**

**Certain observations on the international application**

**1. Clarity - Art. 6 PCT**

- 1.1 Amended dependent claims 7 and 8 contradict amended independent claim 1 since they also claim water soluble materials incorporated into the polymer lattice in contrast to the "materials contained within the lattice are dispersed" as claimed by the independent claim 1. Such materials have to be water insoluble.
- 1.2 Expressions like "*a temperature effective*" as used in claim 10 of the present application are contrary to the requirements of PCT-Guidelines 5.38 since the time span required for freezing the liquid medium has only been provided by the relative term "*rapidly*".
- 1.3 Some embodiments of the invention shown in the examples, e.g. Examples 1-5, do not fall within the scope of the claims since they are silent concerning the shape of the beads obtained after the spray freeze drying process. This inconsistency between the claims and the description leads to doubt concerning the matter for which protection is sought, thereby rendering the claims unclear, Art. 6 PCT. It is clear from the Examples of the present application which have been frozen in moulds that these samples do NOT have a spherical shape, however, it is not excluded that a powder particle e.g. of

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.  
PCT/EP2004/014777

Example 1 of the present application does have a spherical shape. In particular, since the emulsion was sprayed into liquid nitrogen it is reasonable to assume that the powder particles exhibits at least approximately a spherical shape, contrary to the requirements of the claims of the present application.

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**2. Novelty**

- 2.1** The amended independent claim 1 of the present application claims
  - a)** Porous bodies comprising a three dimensional open-cell lattice which porous bodies are water dispersible or water soluble
  - b)** such that materials contained withing the lattice are dispersed when the porous bodies are exposed to an aqueous medium, the porous bodies containing
  - c)** 10-95 % by weight of a water soluble polymeric material and
  - d)** 5-90 % by weight of a surfactant,
  - e)** said porous bodies having an intrusion volume as measured by mercury porosimetry of at least  $3 \text{ ml}^* \text{g}^{-1}$
  - f)** with the proviso that said porous bodies are not spherical beads having an average bead diameter of 0.2-5 mm.
- 2.2** Document **D1** discloses **a)** a porous crosslinked polymer material which is therefore water dispersible having a three dimensional open-cell lattice. **b)** Due to the production process these porous bodies comprise e.g. vegetable oil, light mineral oil, etc. which can be dispersed when the porous bodies are exposed to an aqueous medium. **c)** The porous bodies containing 1-80 % by weight of a water soluble polymeric material e.g. acrylic acid, acrylamide and **d)** 1-60 % by weight of a surfactant, e.g. SDS, **e)** having a pore volume of from  $1-5 \text{ ml}^* \text{g}^{-1}$ . **f)** 50-100 % of the beads are substantially spherical. **g)** A process comprising a freeze drying step is not disclosed (abstract; pages 3-8).
- 2.3** Therefore, amended claims 1-9, 20 and 21 of the present application do not fulfill the requirements of Art. 33(1) PCT since they are not novel over the prior art document **D1** in the sense of Art. 33(2) PCT.
- 2.4** Document **D2** discloses **a)** a hydrophilic porous polymeric material having a three

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/EP2004/014777

dimensional open-cell lattice. **b)** Due to the production process these porous bodies comprise e.g. aliphatic hydrocarbons, toluene, etc. which can be dispersed when the porous bodies are exposed to an aqueous medium. **c)** The porous bodies containing a water soluble polymeric material e.g. acrylic acid, acrylamide and **d)** a surfactant. The amounts are within the range of the present application. **e)** The porous polymer particles show a bulk density within the range of from  $0.001\text{-}1.0 \text{ g*ml}^{-1}$  as also shown in the examples of the present application. **f)** At least approximately 10 % of the microbeads are substantially spherical or ellipsoidal or a combination thereof. **g)** A process comprising a freeze drying step is not disclosed (page 9, lines 30-33; page 11, lines 30-33; page 21, lines 16-33; page 25, lines 19-28; Examples; claims 1, 6, 18, 22, 23).

**2.5** Therefore, claims 1-9, 20 and 21 of the present application do not fulfill the requirements of Art. 33(1) PCT since they are not novel over the prior art document **D2** in the sense of Art. 33(2) PCT.

**2.6** Document **D3** discloses **a)** monodisperse porous polymer beads having a three dimensional open-cell lattice **b)** Due to the production process these porous bodies comprise e.g. light mineral oil, etc. which can be dispersed when the porous bodies are exposed to an aqueous medium. **c)** The porous bodies containing a water soluble polymeric material e.g. acrylamide, N,N-methylenebisacrylamide and **d)** a surfactant. The amounts are within the range of the present application. **e)** The porous polymer particles show intrusion volumes greater than  $8 \text{ cm}^3\text{*g}^{-1}$ . **f)** The shape of the particles can be controlled by the process conditions. **g)** A process comprising a freeze drying step is not disclosed (the whole document).

**2.7** Therefore, claims 1-9, 20 and 21 of the present application do not fulfill the requirements of Art. 33(1) PCT since they are not novel over the prior art document **D3** in the sense of Art. 33(2) PCT.

**2.8** It is pointed out that documents **D5** and **D6** which have been cited in the ISR as a "*P*" and "*E*" document, respectively, might be relevant to the question of novelty in case that the application enters a regional and/or national phase.

**3. Inventive Step**

**3.1** The working-up of porous polymer materials by freeze drying is generally known in the art and can be found in document **D4** for example.

**3.2** Therefore, claims 10-19 do not fulfill the requirements of Art. 33(1) PCT since they do

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.  
PCT/EP2004/014777

not involve an inventive step in the sense of Art. 33(3) PCT.

**4. Industrial Applicability**

**4.1** The subject matter of claims 1-21 is industrial applicable.

AMENDED SHEET

- 1 -

POROUS BODIES AND METHOD OF PRODUCTION THEREOF

The present invention relates to water soluble or water dispersible porous bodies and to methods of producing such porous bodies.

5

Copending international patent application PCT/GB03/03226 (assigned to the present applicants) describes the formation of porous beads comprising a three dimensional open-cell lattice of a water-soluble polymeric material with an average bead diameter in the range 0.2 to 5mm.

10 It is an object of the present invention to provide highly porous bodies which disperse rapidly when contacted with water. It is a further object of the invention to provide a simple and effective method for producing such porous bodies.

15 In accordance with a first aspect of the invention, there is provided water dispersible or water soluble porous bodies comprising a three dimensional open-cell lattice containing

- (a) 10 to 95% by weight of a water soluble polymeric material and
- (b) 5 to 90% by weight of a surfactant,

said porous bodies having an intrusion volume as measured by mercury porosimetry (as hereinafter described) of at least about 3 ml/g

20 with the proviso that said porous bodies are not spherical beads having an average bead diameter of 0.2 to 5mm

25 Preferably the porous bodies of the present invention contain 10 to 80% by weight of the water soluble polymeric material and 20 to 90% by weight of the surfactant. More preferably the porous bodies of the present invention contain 20 to 70% by weight of the water soluble polymeric material and 30 to 80% by weight of the surfactant.

30 The polymeric material is a material which would be considered as "water soluble" by those skilled in the art i.e. if it forms a homogeneous solution in water. In general terms water soluble polymers possess pendant polar or ionizable groups (e.g. -C=O, -OH, -N(R<sub>1</sub>)(R<sub>2</sub>) in which R<sub>1</sub> and R<sub>2</sub>, which may be the same or different, are independently H or (C1 to C4)alkyl, -N(R<sub>3</sub>)(R<sub>4</sub>)(R<sub>5</sub>)<sup>+</sup> in which R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> which may be the same or different, are independently H or (C1 to C4)alkyl, -CON(R<sub>6</sub>)(R<sub>7</sub>) in which R<sub>6</sub> and R<sub>7</sub>, which may be the same or different, are H or (C1 to C4) alkyl, -CH<sub>2</sub>CH<sub>2</sub>O-, -CO<sub>2</sub>H or salts thereof, -SO<sub>3</sub>H or salts thereof groups) on a backbone chain which may be

35 hydrophobic.

AMENDED SHEET

- 2 -

It is also important for the operation of the present invention that the porous bodies dissolve or disperse quickly so that the materials contained within the lattice are dispersed quickly when the porous bodies are exposed to an aqueous medium. It has been found that when water soluble polymeric materials are incorporated into the porous bodies of the present invention, the time it takes for the polymeric material to dissolve or disperse may be significantly reduced. The nature of the lattice should be such that the dissolution or dispersion of the porous bodies preferably occurs in less than three minutes, more preferably less than two minutes, most preferably less than one minute.

10 Examples of water soluble polymeric materials include:-

(a) natural polymers (for example naturally occurring gums such as guar gum or locust bean gum or a polysaccharide such as dextran ~~or cellulose~~;

(b) cellulose derivatives for example xanthan gum, xyloglucan, cellulose acetate, methylcellulose, methylethylcellulose, hydroxyethylcellulose, hydroxyethylmethylcellulose, hydroxypropylcellulose,

15 hydroxypropylmethylcellulose (HPMC), hydroxypropylbutylcellulose, ethylhydroxyethylcellulose, carboxymethylcellulose and its salts (eg the sodium salt - SCMC), or carboxymethylhydroxyethylcellulose and its salts (for example the sodium salt);

(c) homopolymers of any one of the monomers listed in Table 1 below;

(d) copolymers prepared from two or more monomers listed in Table 1 below;

20 (e) mixtures thereof

Table 1

- vinyl alcohol,
- acrylic acid,
- methacrylic acid
- 25 acrylamide,
- methacrylamide
- acrylamide methylpropane sulphonates
- aminoalkylacrylates
- aminoalkylmethacrylates
- 30 hydroxyethylacrylate
- hydroxyethylmethylacrylate
- vinyl pyrrolidone
- vinyl imidazole
- vinyl amines
- 35 vinyl pyridine

AMENDED SHEET

- 9 -

porous bodies of the present invention.-The polymeric porous bodies may be in the form of powders, beads (but not spherical beads having an average bead diameter of 0.2 to 5 mm) or moulded bodies. Powders may be prepared by the disintegration of polymeric porous bodies in the form of beads or moulded bodies either before or after freeze-drying.

5

In accordance with another aspect of the present invention, there is provided a method for water dispersible or water soluble porous bodies comprising a three dimensional open-cell lattice containing

(a) 10 to 95% by weight of a water soluble polymeric material and  
10 (b) 5 to 90% by weight of a surfactant,  
said porous bodies having an intrusion volume as measured by mercury porosimetry (as herein described) of at least about 3 ml/g  
with the proviso that said porous body is not a spherical bead having an average bead diameter of 0.2 to 5mm  
15 comprising the steps of:  
a) providing an intimate mixture of the polymeric material and the surfactant in a liquid medium  
b)  
providing a fluid freezing medium at a temperature effective for rapidly freezing the liquid medium;  
20 c) cooling the liquid medium with the fluid freezing medium at a temperature below the freezing point of the liquid medium for a period effective to rapidly freeze the liquid medium; and  
(d) freeze-drying the frozen liquid medium to form the polymeric bodies by removal of the liquid medium by sublimation.  
25 The intimate mixture of the polymeric material and the surfactant in the liquid medium may be an oil-in-water emulsion comprising a continuous aqueous phase containing the polymeric material, a discontinuous oil phase and the surfactant.

When the porous body is to be in the form of a powder the cooling of the liquid medium may be accomplished by spraying the liquid medium in atomised form into the fluid freezing medium. When the porous body is to be in the form of beads the cooling of the liquid medium may be accomplished by dropping drops of the liquid medium into the fluid freezing medium. Porous bodies in the form of moulded bodies may be made by pouring the liquid medium into a mould and cooling the liquid medium by the fluid freezing medium. In a preferred process of the invention to

- 29-03-2006

EP0414777

CLAIMS

1. Porous bodies comprising a three dimensional open-cell lattice which porous bodies are water dispersible or water soluble such that materials contained within the lattice are dispersed when the porous bodies are exposed to an aqueous medium, the porous bodies containing

- (a) 10 to 95% by weight of a water soluble polymeric material and
- (b) 5 to 90% by weight of a surfactant,

said porous bodies having an intrusion volume as measured by mercury porosimetry of at least 3ml/g

with the proviso that said porous bodies are not spherical beads having an average bead diameter of 0.2 to 5mm.

2. Porous bodies as claimed in claim 1 wherein the bodies are in the form of powders, beads or moulded bodies.

3. Porous bodies as claimed in claim 1 or claim 2 wherein the polymeric material is a natural gum, a polysaccharide, a cellulose derivative or a homopolymer or copolymer comprising (co)monomers selected from:-

- vinyl alcohol,
- acrylic acid,
- methacrylic acid
- acrylamide,
- methacrylamide
- acrylamide methylpropane sulphonates
- aminoalkylacrylates
- aminoalkylmethacrylates
- hydroxyethylacrylate
- hydroxyethylmethacrylate
- vinyl pyrrolidone
- vinyl imidazole
- vinyl amines
- vinyl pyridine
- ethyleneglycol
- ethylene oxide
- ethyleneimine

AMENDED SHEET

- 40 -

styrenesulphonates  
ethyleneglycolacrylates  
ethyleneglycol methacrylate

5    4) Porous bodies as claimed in claim 3 wherein the cellulose derivative is selected from xanthan gum; xyloglucan; cellulose acetate; methylcellulose; methylethylcellulose; hydroxyethylcellulose; hydroxyethylmethylcellulose; hydroxypropylcellulose; hydroxypropylmethylcellulose (HPMC); hydroxypropylbutylcellulose; ethylhydroxyethylcellulose; carboxymethylcellulose and its salts, or carboxymethyl-hydroxyethylcellulose and its salts

10      5) Porous bodies as claimed in any preceding claim wherein the surfactant is non-ionic, anionic, cationic, or zwitterionic

15      6) Porous bodies as claimed in any preceding claim wherein the surfactant is selected from ethoxylated triglycerides; fatty alcohol ethoxylates; alkylphenol ethoxylates; fatty acid ethoxylates; fatty amide ethoxylates; fatty amine ethoxylates; sorbitan alkanoates; ethylated sorbitan alkanoates; alkyl ethoxylates; pluronics; alkyl polyglucosides; stearol ethoxylates; alkyl polyglycosides; alkylether sulfates; alkylether carboxylates; alkylbenzene sulfonates; alkylether phosphates; dialkyl sulfosuccinates; alkyl sulfonates; soaps; alkyl sulfates; alkyl carboxylates; alkyl phosphates; paraffin sulfonates; secondary n-alkane sulfonates; alpha-olefin sulfonates; isethionate sulfonates; fatty amine salts; fatty diamine salts; quaternary ammonium compounds; phosphonium surfactants; sulfonium surfactants; sulfonxonium surfactants; N-alkyl derivatives of amino acids (such as glycine, betaine, aminopropionic acid); imidazoline surfactants; amine oxides; amidobetaines; and mixtures thereof

20      7) Porous bodies as claimed in any preceding claim wherein the porous polymeric bodies have water soluble or water insoluble materials incorporated into the polymeric lattice

25      8) Water soluble porous polymeric bodies as claimed in claim 7 wherein the water soluble material is selected from water soluble vitamins; water soluble fluorescers; activated aluminium chlorohydrate; transition metal complexes used as bleaching catalysts; water soluble polymers; diethylenetriaminepentaacetic acid (DTPA); primary and secondary alcohol sulphates containing greater than C8 chain length or mixtures thereof

AMENDED SHEET

- 41 -

9) Water soluble porous polymeric bodies as claimed in claim 7 wherein the water insoluble material is selected from antimicrobial agents; antidandruff agent; skin lightening agents; fluorescing agents; antifoams; hair conditioning agents; fabric conditioning agents; skin conditioning agents; dyes; UV protecting agents; bleach or bleach precursors; antioxidants; insecticides; pesticides; herbicides; 5 perfumes or precursors thereto; flavourings or precursors thereto; pharmaceutically active materials; hydrophobic polymeric materials and mixtures thereof.

10) A method for preparing water dispersible or water soluble porous bodies comprising a three dimensional open-cell lattice containing

10 (a) 10 to 95% by weight of a water soluble polymeric material and  
(b) 5 to 90% by weight of a surfactant,  
said porous bodies having an intrusion volume as measured by mercury porosimetry (as hereinafter described) of at least 3 ml/g  
with the proviso that said porous bodies are not spherical beads having an average bead diameter 15 of 0.2 to 5mm

comprising the steps of:

a) providing an intimate mixture of the polymeric material and the surfactant in a liquid medium  
20 b) providing a fluid freezing medium at a temperature effective for rapidly freezing the liquid medium;  
c) cooling the liquid medium with the fluid freezing medium at a temperature below the freezing point of the liquid medium for a period effective to rapidly freeze the liquid medium; and  
25 d) freeze-drying the frozen liquid medium to form the porous bodies by removal of the liquid medium by sublimation.

11) A method as claimed in claim 10 wherein the cooling of the liquid medium is accomplished by spraying an atomised emulsion into the fluid freezing medium; by dropping drops of the emulsion 30 into the fluid freezing medium or by pouring the emulsion into a mould and cooling the emulsion in the mould.

12) A method as claimed in claim 10 or 11 wherein the polymeric material is a natural gum, a polysaccharide, a cellulose derivative or a homopolymer or copolymer comprising (co)monomers 35 selected from:-

AMENDED SHEET

- 42 -

vinyl alcohol,  
acrylic acid,  
methacrylic acid  
acrylamide,  
5 methacrylamide  
acrylamide methylpropane sulphonates  
aminoalkylacrylates  
aminoalkylmethacrylates  
hydroxyethylacrylate  
10 hydroxyethylmethylacrylate  
vinyl pyrrolidone  
vinyl imidazole  
vinyl amines  
vinyl pyridine  
15 ethyleneglycol  
ethylene oxide  
ethyleneimine  
styrenesulphonates  
ethyleneglycolacrylates  
20 ethyleneglycol methacrylate

13) A method as claimed in any one of claims 10 to 12 wherein the surfactant is non-ionic, anionic, cationic, or zwitterionic

25 14) A method as claimed in any one of claims 10 to 13 wherein the surfactant has an HLB value of 8 to 18

15) A method as claimed in any one of claims 10 to 14 wherein the surfactant is selected from ethoxylated triglycerides; fatty alcohol ethoxylates; alkylphenol ethoxylates; fatty acid ethoxylates; 30 fatty amide ethoxylates; fatty amine ethoxylates; sorbitan alkanoates; ethylated sorbitan alkanoates; alkyl ethoxylates; pluronics; alkyl polyglucosides; stearol ethoxylates; alkyl polyglycosides; alkylether sulfates; alkylether carboxylates; alkylbenzene sulfonates; alkylether phosphates; dialkyl sulfosuccinates; alkyl sulfonates; soaps; alkyl sulfates; alkyl carboxylates; alkyl phosphates; paraffin sulfonates; secondary n-alkane sulfonates; alpha-olefin sulfonates; isethionate sulfonates; fatty 35 amine salts; fatty diamine salts; quaternary ammonium compounds; phosphonium surfactants;

AMENDED SHEET

- 43 -

sulfonium surfactants; sulfonxonium surfactants; N-alkyl derivatives of amino acids (such as glycine, betaine, aminopropionic acid); imidazoline surfactants; amine oxides; amidobetaines; and mixtures thereof

- 5      16) A method as claimed in claim 10 wherein the intimate mixture is an oil-in-water emulsion
- 17) A method as claimed in claim 16 wherein the discontinuous phase of the emulsion comprises 10 to 95% by volume of the emulsion
- 10     18) A method as claimed in claim 16 wherein the discontinuous phase of the emulsion comprises 20 to 60% by volume of the emulsion
- 19) A method as claimed in claim 16 wherein the discontinuous phase of the emulsion is selected from alkanes; cyclic hydrocarbons; halogenated alkanes; esters; ketones;
- 15     ethers; volatile cyclic silicones and mixtures thereof
- 20) Solutions or dispersions comprising water soluble polymeric materials and surfactant formed by exposing the porous bodies of any one of claims 1 to 9 to an aqueous medium.
- 20     21) Solutions or dispersions comprising water soluble polymeric materials, surfactant and a hydrophobic material formed by exposing the porous bodies of claim 7 having the hydrophobic material contained therein to an aqueous medium.